

5.0 Project Identification and Recommendations

The EWCTS team used the results of interviews, surveys, and research to develop a list of recommended improvement projects and a list of coordination and program recommendations. (See Section 2.2, Roadway Characteristics, Section 3.0, Future Conditions in the Study Area, and the appendices that follow Section 7.0 for more detailed information about existing or expected issues along the study corridors.) This section focuses on the process used to develop the lists and how the recommended project list was prioritized. Because access management is always a primary concern of local governments and of UDOT along rural corridors, this section also includes a section on access management along the study corridors.

5.1 Project Identification Methodology

The EWCTS identified projects using a variety of methods. The planning process included interviews, public meetings, Internet-based comment opportunities, and analysis of existing and expected roadway conditions.

Communication with agency representatives, local governments, UDOT employees, and business interests helped identify projects that would directly address existing and future corridor issues. Section 4.0, Public Involvement, describes these stakeholders' involvement in the study process.

The general public provided input on the corridors at two public outreach events as described in Section 4.0: the St. George Transportation Expo and a EWCTS open house. The public reiterated much of what the study team heard from local governments regarding needs on a more regional level, but also provided valuable information about specific issues at local intersections or pointed out local roadway geometry issues that needed to be addressed in the planning process.

Finally, to help define projects that would improve the long-term uses and development of the corridor, the team conducted technical analyses of accident data, existing and future levels of service, traffic forecasts, and population and employment forecasts. The team reviewed the physical condition of the corridor by looking at information on roadway geometry, pavement condition, average right-of-way width, shoulder width, and structures.



5.2 Project Lists

The information gained through stakeholder involvement, public input, and the results of technical analyses was used to create an initial list of projects. This list was then filtered by the project team to ensure that the recommendations were consistent with UDOT's vision and goals for the corridors (see Section 1.0, Introduction). As the list evolved, some separately identified projects were combined where it made sense to do so (for example, similar types of projects along the length of a particular highway, such as turn lanes along SR-9).

Once the large "master list" was complete, it was then split into two lists by type of project: (1) more traditional improvement projects and (2) other coordination efforts or programs that are not specific or need further consideration by UDOT, coordinating parties (such as local governments), or both. The coordination efforts and programs are not ranked because, in most cases, implementation will depend on initiation by or the participation of other parties, or, in some cases, coordination will be ongoing through the life of the plan.

For the most part, the improvement project list does not include the construction, study, or coordination regarding bypass or new connection routes. UDOT recognizes that there are ongoing discussions at the local level regarding a potential bypass of SR-17 (a Toquerville bypass) and new connections between SR-9 and SR-59 east of La Verkin, SR-17 and I-15 near Leeds, SR-17 and SR-9 east of La Verkin, and SR-59 and the Southern Corridor south of Hurricane. The improvement project list focuses on mainline improvements, with the exception of the immediate need for improvements to the intersection of SR-59 and SR-9 (Project 59-A), which could be accomplished using a new connection or bypass. The coordination list includes items to address other than the other potential bypass and alternate routes. In all cases, early coordination with UDOT is critical if the parties want to someday designate the bypasses or new routes as state routes (an example being the potential redesignation of the Toquerville bypass as the "new" SR-17 and transferring management of the existing SR-17 to the city in "trade").

Table 5-1 below lists the recommended improvement projects by rank for each highway and supporting information about or findings that support each project's inclusion in the list. Figure 6 through Figure 11 below show the geographic location of each project. Table 5-2 below lists the coordination agreements and programs that will support future management of the corridor. The lists are intended only to provide UDOT with information and are in no way intended to require construction of specific projects or completion of studies in a specific order. While Table 5-1 simply lists the projects by rank, the Implementation Program presented in Section 6.1, Implementation, provides recommendations for the order in which projects could be constructed given project relationships (such as projects in the same location or projects that could not be constructed without other prior or simultaneous improvements).

**Table 5-1. EWCTS Recommended Improvement Projects**

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
State Route 9, Hurricane to Zion National Park Boundary					
9-A	Add pedestrian walkway to the west side of the Virgin River Bridge, MP 11, westbound.	4.5	10	19	From local government. Students walking to the school that is on the west side of the road but south of the bridge currently have to cross the highway to the east side, cross the river on the existing east-side pedestrian walkway, and cross back over to the west side to get across river. This inconvenience leads to unsafe crossing by students and others. Also, the existing sidewalk on the west side ends at the bridge ("sidewalk to nowhere").
9-B	Add rumble strips (both directions) between the following points: <ul style="list-style-type: none"> • MP 12.5 to MP 16.8 • MP 18.4 to MP 19.1 • MP 19.6 to MP 27.7 	5.15	9 (tie)	18 (tie)	From safety studies. Shoulder and center rumble strips recommended for all corridors by Utah Highway Patrol (UHP).
9-C	Install a two-way left-turn lane between the following points: <ul style="list-style-type: none"> • MP 12.4 to MP 13.0 • MP 17.3 to MP 18.0 • MP 27.47 (through Rockville) • MP 30.0 to MP 33.0 (through Springdale) 	8.3	2	5 (tie)	From safety studies. Note that Rockville City has stated that it does not want the two-way left-turn lane through town.
9-D	Add a second traffic lane to improve intersection of SR-9 and SR-17, MP 13.0 to MP 12.5.	7.075	3 (tie)	7 (tie)	From local government, safety study, and public comment. Per UDOT, this project is already being considered.
9-E	Improve curve delineation at the following locations: <ul style="list-style-type: none"> • MP 13.2, eastbound • MP 13.9, eastbound • MP 14.8, eastbound • MP 15.0, westbound • MP 19.0, eastbound (note: error in MP system) • MP 20.1, eastbound (also add curve and arrow signs) 	5.2	7 (tie)	16 (tie)	From safety studies.

Table 5-1. EWCTS Recommended Improvement Projects

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
9-F	Remove vertical curve to improve sight distance, MP 13.5.	5.2	7 (tie)	16 (tie)	From safety studies.
9-G	Widen shoulder and flatten side slope or add barrier/guardrail, MP 13.6 to MP 13.7, eastbound.	5.175	8	17 (tie)	From safety studies.
9-H	Widen shoulders to standard between the following points: <ul style="list-style-type: none"> • MP 12.7 to MP 13.1, eastbound • MP 14.4 to MP 13.9, westbound • MP 16.9 to MP 16.5, westbound • MP 29.2 to MP 28.7, westbound 	6.325	5	12	<p>From public and local agency comments. There is heavy use by cyclists and pedestrians between Rockville and Springdale, where the existing shoulder is very narrow and/or obstructed with debris from rockfall, etc. (about MP 28 to about MP 29.5). Would need to confirm that what is constructed is consistent with or does not hinder application of the recommendations in the Zion Canyon Trail Feasibility Study (UDOT, no date).</p> <p>A related request was to stripe bicycle lanes between Rockville and the Zion National Park entrance in Springdale.</p> <p>The right-of-way between Rockville and Springdale (about MP 28 to about MP 29.5) won't accommodate an on-highway bicycle lane; will need to coordinate with both towns if an off-highway bicycle trail is to be constructed (Springdale is planning a Class I trail; might be able to connect into this).</p>
9-I	Add turn lanes as follows: <ul style="list-style-type: none"> • Left-turn pocket onto La Verkin overlook, MP 14.9, westbound • Left-turn storage to the south for "T" intersection, MP 16.1, westbound • Left-turn storage, MP 21, westbound • Left-turn storage, MP 25.8, westbound 	7.075	3 (tie)	7 (tie)	From safety studies.
9-J	Extend culverts as follows: <ul style="list-style-type: none"> • Extend culvert and remove guardrail, MP 16.4, both directions • Extend culvert, MP 30.4, both directions 	5.8	6 (tie)	15 (tie)	From safety studies.

**Table 5-1. EWCTS Recommended Improvement Projects**

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
9-K	Extend guardrail to the south at the following locations: <ul style="list-style-type: none"> • MP 15.31, eastbound (for 200 feet) • MP 16.8, eastbound (for 200 feet) • MP 17.5, eastbound (for 200 feet) • MP 20.3, eastbound (for 200 feet) • MP 21.1, eastbound (for 200 feet) • MP 21.8, eastbound (for 200 feet) • MP 23.5, eastbound (for 400 feet) • MP 24.2, eastbound (for 300 feet) • MP 25.3 to MP 25.4, eastbound (add approved end section) • MP 25.4, westbound (add approved end section) 	5.15	9 (tie)	18 (tie)	From safety studies. Will ultimately be included in region's guardrail program.
9-L	Raise sag curve to improve sight distance, MP 18.1, both directions.	5.2	7	16 (tie)	From safety studies.
9-M	Construct climbing and passing lanes as follows: <ul style="list-style-type: none"> • Climbing lanes, MP 16.1 to MP 15.8, westbound • Passing lane, MP 15.0 to MP 15.6, eastbound • Passing lane, MP 20.6 to MP 23.5, both directions • Climbing lane, MP 26.7 to 26.3, westbound 	7.075	3 (tie)	7 (tie)	From safety studies.
9-N	Add attenuator to barrier ends at the following locations: <ul style="list-style-type: none"> • MP 17.28, eastbound (note: error in MP system) • MP 25.39, both directions 	3.875	11 (tie)	20 (tie)	From safety studies.
9-O	Add turn storage and signage at intersection of SR-9 and Kolob Reservoir Road to address intersection safety and address sight distance issues, MP 18.7, both directions.	8.95	1	3	From local agency comments, public comments, and safety studies. Current speed is probably too high; sight distance is limited (intersection is at the top of a hill).
9-P	Relocate/reconstruct Kolob Reservoir Road, MP 18.7, both directions.	6.975	4	9 (tie)	Modifications beyond just adding turn lanes. Timing will depend on when Virgin makes other local improvements. Might be beyond 2030.

Table 5-1. EWCTS Recommended Improvement Projects

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
9-Q	Add raised markers to help delineate curves, MP 27.0 through MP 30.3, both directions.	5.8	6 (tie)	15 (tie)	From safety studies.
9-R	Remove hazardous rock wall, MP 30.0, eastbound.	3.875	11 (tie)	20 (tie)	From Horrocks evaluation. This is a private residence.
9-S	Rehabilitate the following structures: <ul style="list-style-type: none"> • O F 468 (North Creek), MP 19.3 • O F 82 (Springdale Wash), MP 31.5 (consider replacing in 10–15 years) 	5.15	9 (tie)	18 (tie)	
State Route 17, La Verkin to I-15					
17-A	Add backup power source to signal at intersection with SR-9, MP 0.	5.15	8 (tie)	18 (tie)	From local agency. Power outages several times a year create hazards because lights go completely dark when power fails. Tourists and others unfamiliar with the area do not know to stop, which has resulted in dangerous conflicts, especially at night.
17-B	Add rumble strips (both directions) between the following points: <ul style="list-style-type: none"> • MP 1.9 to MP 2.9 • MP 3.5 to MP 5.8 	5.15	8 (tie)	18 (tie)	From safety studies and public comments. Shoulder and center rumble strips are recommended for all corridors by UHP. Immediate need identified for center rumble strip at about MP 2.5; problem with drifting over the center line.
17-C	Widen clear zone, install retaining walls to accommodate wider shoulder, MP 0.26 to MP 0.6, both directions but especially northbound.	5.8	6	15 (tie)	From the City. Debris falls onto the road from the east side, and the west side is undercut pretty severely in some places. Extends from end of existing sidewalk to La Verkin Creek Bridge. The City also asked for sidewalk extension; could be coordinated through this.
17-D	Add two-way left-turn lanes (permissive) between the following points: <ul style="list-style-type: none"> • MP 0.6 to MP 0.9 (begin flare at north end of La Verkin Creek Bridge) • MP 1.5 to MP 2.0 • MP 2.8 to MP 3.4 (through Toquerville) 	8.3	1	5 (tie)	From public comments and safety study (two-way left-turn lane through Toquerville). Toquerville residents do not want a two-way left-turn lane through town. Might not be needed if a bypass is constructed. Could restripe existing pavement to accommodate a two-way left-turn lane through this area.
17-E	Repair pavement at La Verkin Creek Bridge and repair bridge rail transition on bridge approach (northbound), MP 0.6.	5.15	8 (tie)	18 (tie)	From safety studies (barrier) and city and public comments (pavement). Pavement has settled, resulting in a bump at about MP 0.6. Noisy for residents living adjacent to the road.

**Table 5-1. EWCTS Recommended Improvement Projects**

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
17-F	Widen shoulders to standard between the following points: <ul style="list-style-type: none"> • MP 0.83, extend northbound • MP 0.87 to MP 2.2, both directions • MP 3.5 to MP 5.8, both directions 	6.35	4	11	From safety studies.
17-G	Improve curve safety by adding left-turn storage, MP 1.2, southbound (<i>also see items 17-I and 17-K</i>).	7.05	2	8	From public comments. The curve was recently widened to the inside to accommodate a new turn lane for a subdivision, but this item is focused on the outside of the curve. Not included in the safety study, but identified as a problem by the public.
17-H	Replace “Texas turndown” guardrail, extend guardrail as needed in the following locations: <ul style="list-style-type: none"> • MP 1.48, northbound • MP 4.07, southbound 	5.15	8 (tie)	18 (tie)	From safety studies. Will ultimately be included in region’s guardrail program.
17-I	Install barrier or guardrail between the following points: <ul style="list-style-type: none"> • MP 1.2 to MP 1.0, southbound (<i>also see items 17-G and 17-K</i>) • MP 1.4 to MP 1.3, northbound (extend guardrail back to bottom of slope, about 500 feet) • MP 2.6 to MP 2.8, southbound • MP 4.07 (update and replace this section of guardrail) 	5.15	8 (tie)	18 (tie)	From safety studies.
17-J	Construct passing lanes, MP 4.3 to MP 4.9, both directions.	6.425	3	10	From safety studies.
17-K	Improve curve delineation in the following locations: <ul style="list-style-type: none"> • MP 1.2 to MP 1.0, southbound (<i>also see items 17-I and 17-G</i>) • MP 5.08 to MP 5.52, northbound 	5.175	7	17(tie)	From safety studies.
17-L	Widen highway to four lanes.	5.9	5	13	From Horrocks evaluation. Might not be necessary if Toquerville bypass is constructed.

Table 5-1. EWCTS Recommended Improvement Projects

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
State Route 59, Utah–Arizona Border to Hurricane					
59-A	Initiate study to determine best solution for addressing circulation, congestion, and safety issues associated with the intersection of SR-59 and SR-9 in Hurricane. Develop preferred solution as needed to carry project through funding and environmental.	12.025	1	1	From public comments and the City. Two general well-known options are: <ul style="list-style-type: none"> • Reconstruct/reconfigure existing intersection. • Reroute to intersect/connect in a different location.
59-B	Add rumble strips, MP 0 to MP 22, both directions.	5.15	8 (tie)	18 (tie)	From safety study. Shoulder and center rumble strips are recommended for all corridors by UHP.
59-C	Widen shoulders to standard along the entire corridor (MP 0 to MP 22), but especially between the following points: <ul style="list-style-type: none"> • MP 22.0 to MP 21.1, southbound • MP 19.6 to MP 20.3, both directions • MP 17.3 to MP 17.8, southbound • MP 12.3 to MP 12.7, northbound 	6.975	5	9 (tie)	From public comments, City (Apple Valley), and safety studies. Would also address public comments regarding the need for a wider shoulder to accommodate bicycle use. Specific mention of MP 20–MP 22 in public comments. Other work at SR-9/SR-59 intersection might also address the need at MP 22.0.
59-D	Construct two-way left-turn lanes in the following locations: <ul style="list-style-type: none"> • Extend existing MP 0.64 to MP 0.27, southbound • MP 4.5 to MP 5.4 • Extend existing MP 9.8 to MP 10.1 • Extend existing MP 10.5 to MP 10.7 	8.925	3	4	From public comments, the City, and safety studies. High-speed traffic and a lack of shoulders and turn lanes make turning movements onto side roads dangerous. Would need to be coordinated with passing-lane projects. Apple Valley also requested a continuous two-way left-turn lane between about MP 8 and MP 12; might want to add a two-way left-turn lane at about MP 8 as Apple Valley expects this intersection to become critical as the area develops over the next 5 years.
59-E	Construct climbing and passing lanes as follows: <ul style="list-style-type: none"> • Passing lane, MP 2.0 to MP 3.5, both directions • Passing lane, MP 8.2 to MP 9.1, both directions • Climbing lane, MP 13.0 to MP 14.1, both directions • Extend passing lane, MP 15.7 to MP 17.0, southbound • Passing lane, MP 15.7 to MP 17.0, northbound • Passing lane, MP 19.5 to MP 18.0, northbound 	7.65	4	6	From safety studies and public comments.

**Table 5-1. EWCTS Recommended Improvement Projects**

Project ID	Project Description	Average Score (weighted max total = 15)	Rank by Highway	Overall Rank	Project Need/Information
59-F	Construct right- and left-turn lanes (for storage) at the following locations: <ul style="list-style-type: none"> • Left-turn storage, MP 8.1 (Apple Valley Main Street), both directions • Right-turn storage, MP 11.9, both directions • Left-turn storage, MP 14.6 (Kokopelli Golf Course), northbound • Left-turn storage, MP 21.2, southbound • Add left-turn lanes to improve intersection, MP 22.02 (100 South and 100 East in Hurricane), both directions • Add left-turn lanes to improve intersection, MP 22.05 (Main St. and 100 South in Hurricane), both directions 	9.5	2	2	From safety studies, public comments, and the City. High speeds make turning movements dangerous between about MP 0 and MP 18. Geographic constraints contribute to the need for safe turning movements between about MP 18 and MP 22 (Hurricane Cliffs area).
59-G	Widen clear zone in the following locations: <ul style="list-style-type: none"> • MP 9.88, northbound • MP 16.83, southbound • MP 17.05, southbound • MP 20.25, southbound • MP 21.92, southbound 	5.825	6	14	From safety studies.
59-H	Repair 4-inch edge drop, MP 16.4, southbound.	5.175	7	17 (tie)	From safety studies.
59-I	Install barrier, MP 19.6 to MP 20.0, northbound.	5.15	8 (tie)	18 (tie)	From safety studies.
59-J	Add supports to guardrail, MP 21.95, southbound.	3.2	9	21	From safety studies.

Figure 6. SR-9 Recommended Projects (1 of 2)

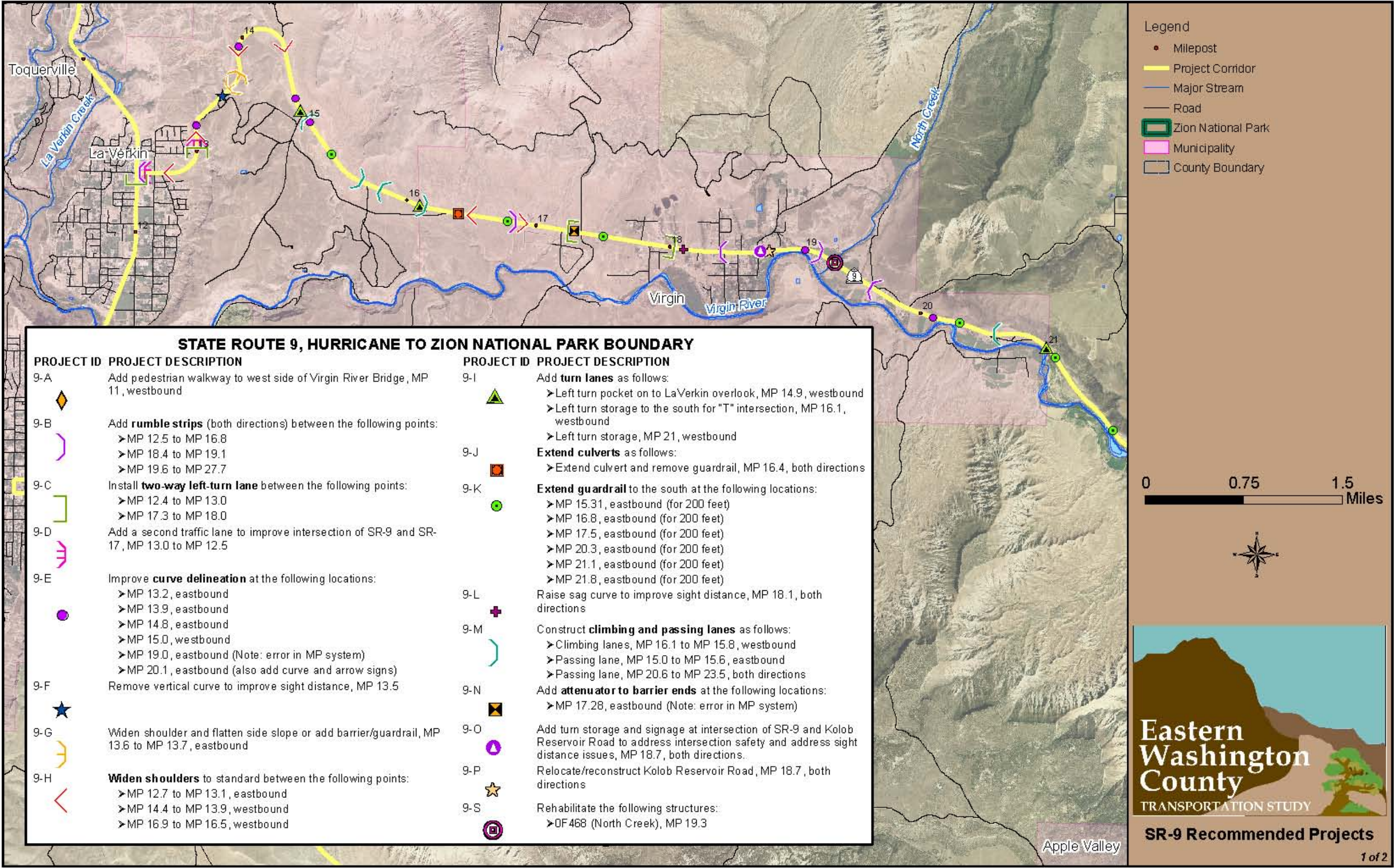




Figure 7. SR-9 Recommended Projects (2 of 2)

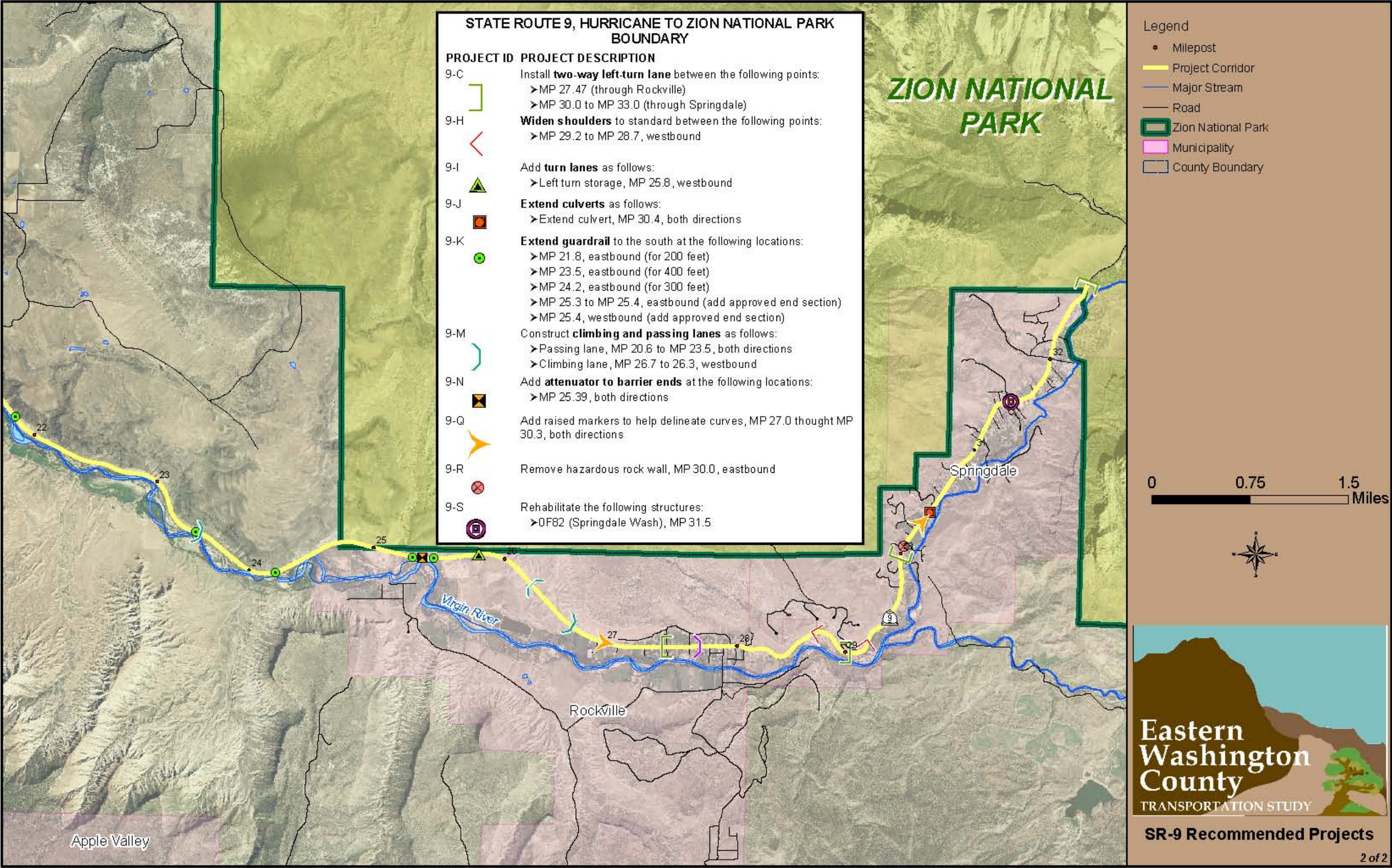


Figure 8. SR-17 Recommended Projects (1 of 2)

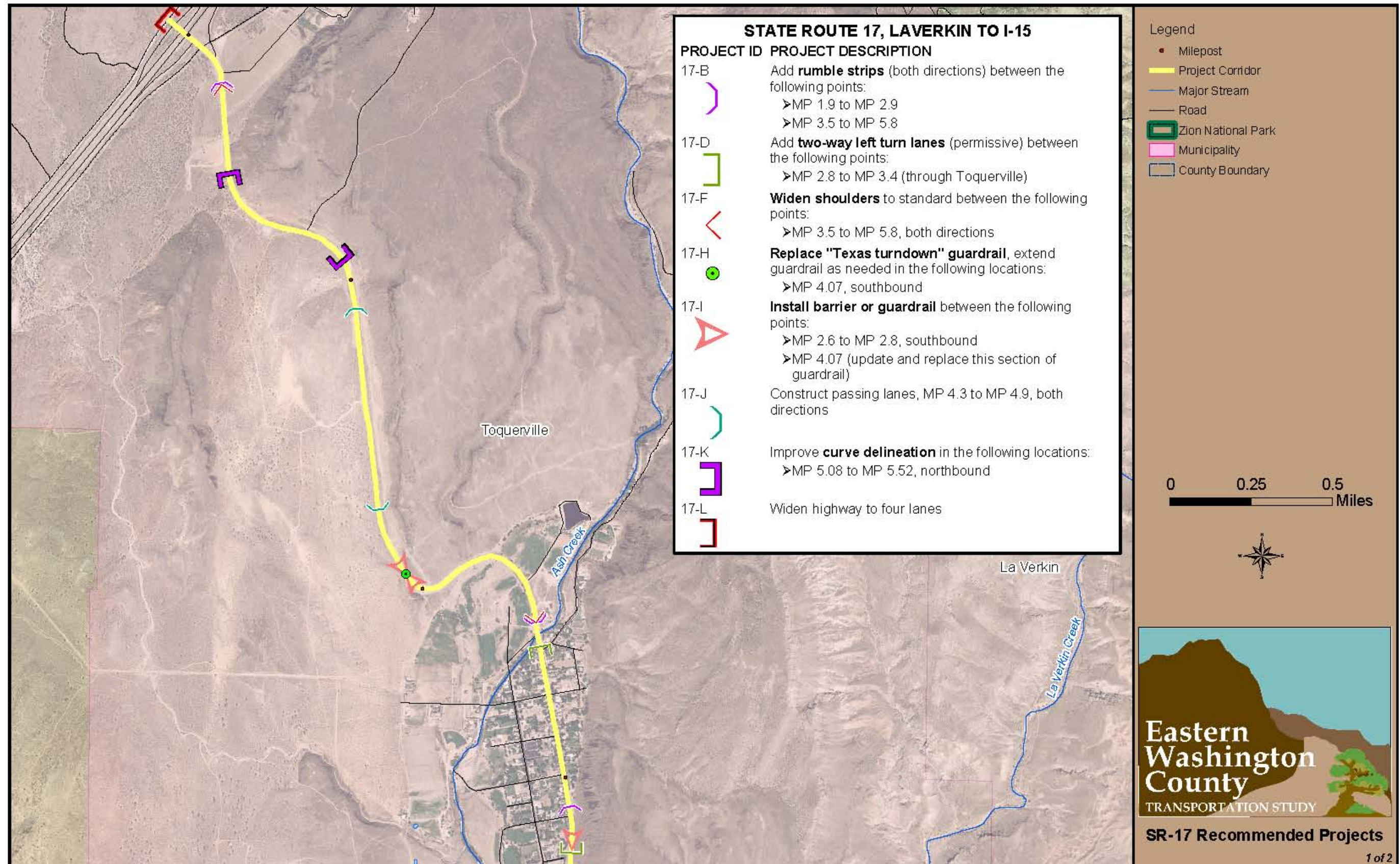




Figure 9. SR-17 Recommended Projects (2 of 2)

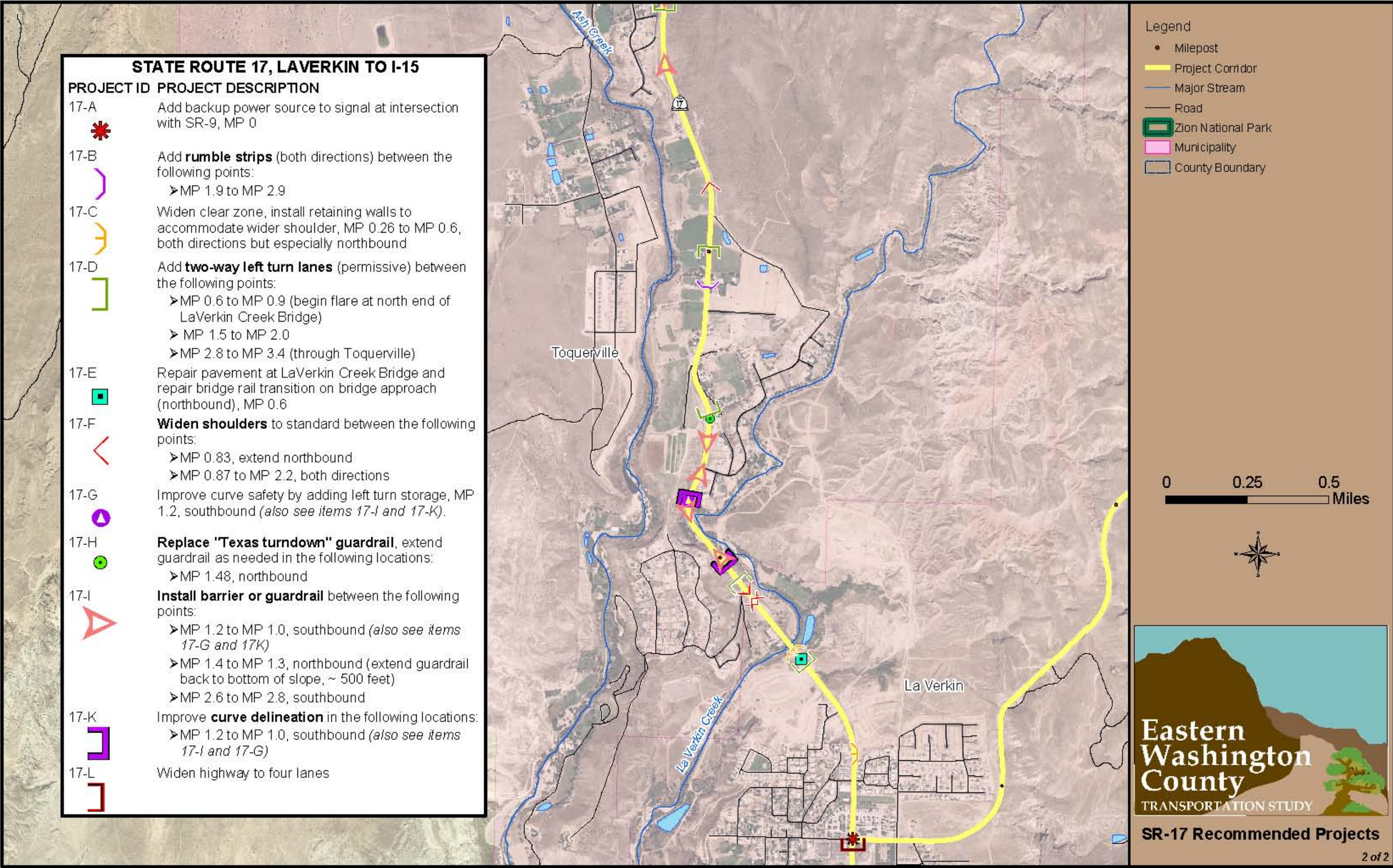


Figure 10. SR-59 Recommended Projects (1 of 2)

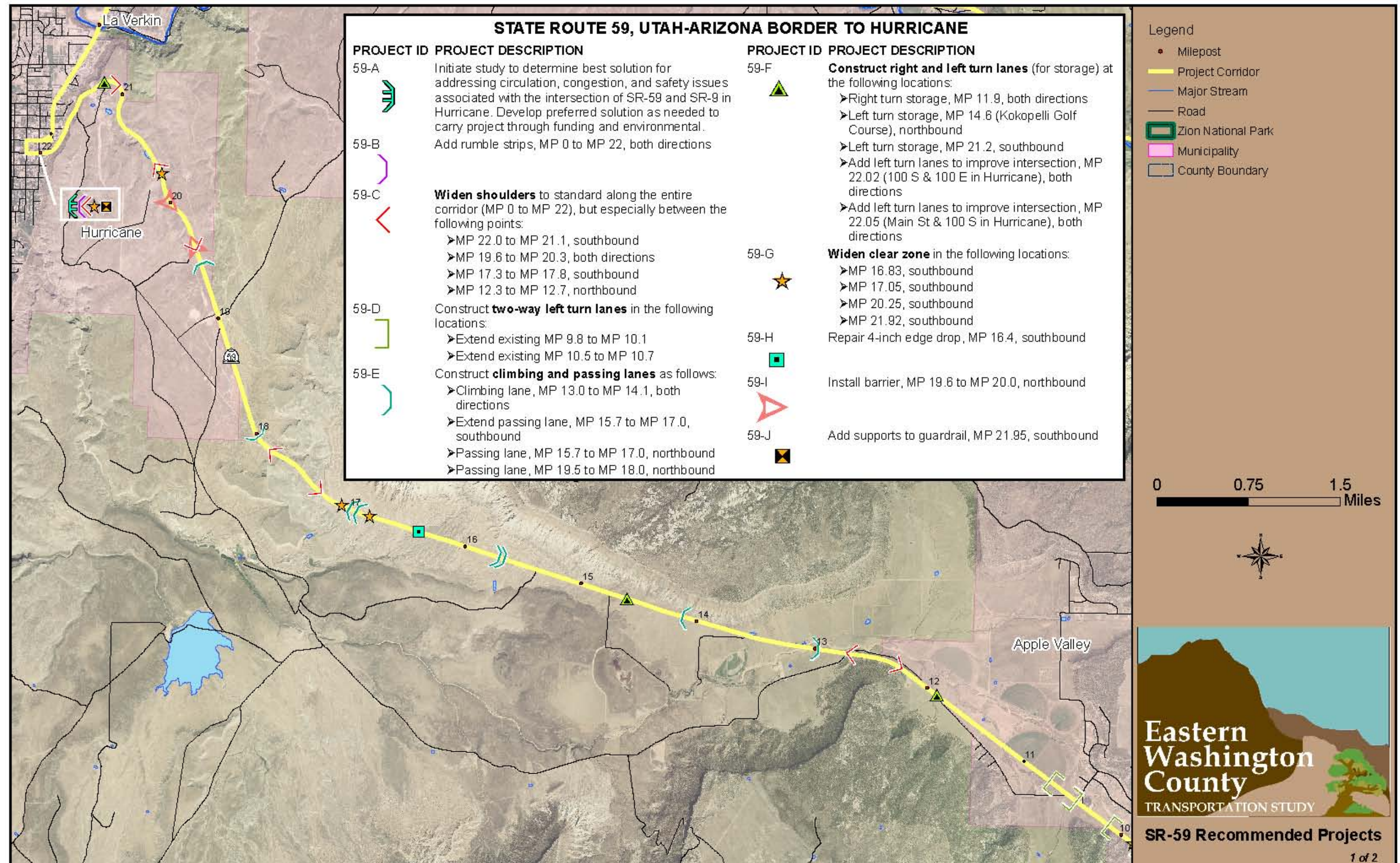




Figure 11. SR-59 Recommended Projects (2 of 2)

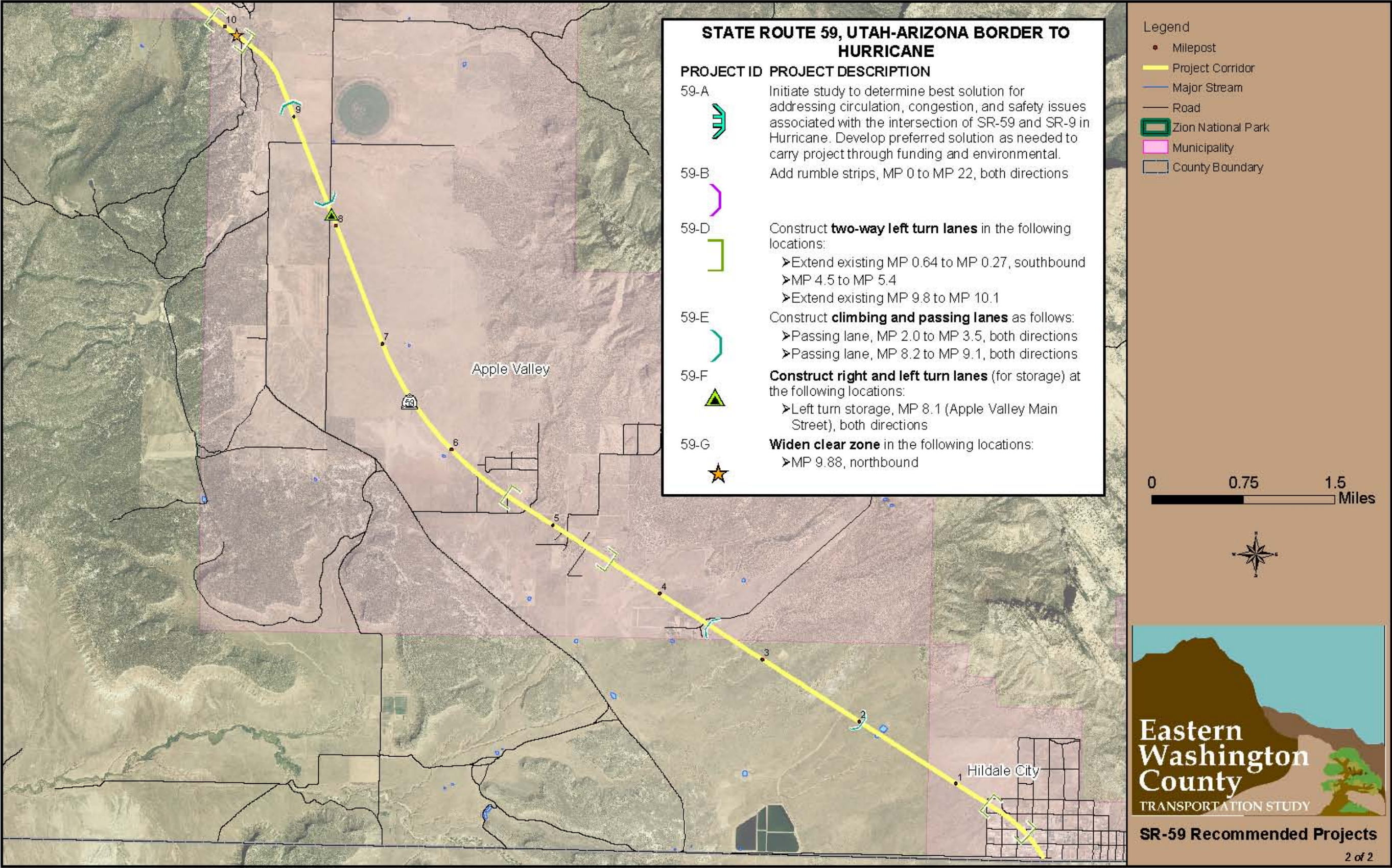


Table 5-2. EWCTS Recommended Coordination Agreements and Programs

Agreement/Program	Timeframe
<p>Sign Programs (all highways): Evaluate types and locations of signs needed and develop plan/schedule for installation.</p> <ul style="list-style-type: none"> • SR-9 sign program should include multiple-language signs, directional signs for Zion National Park, “share the road” signs, signs as listed in the Horrocks Safety Study, and sign needs identified by the public and agencies (for example, intersections, pedestrians). • SR-17 sign program should include multiple-language signs, directional signs for Zion National park, signs as listed in the Horrocks Safety Study, and sign needs identified by the public and agencies. • SR-59 sign program should include directional signs for BLM recreation areas (Gooseberry Mesa, Little Creek Mesa), signs as listed in the Horrocks Safety Study, and sign needs identified by the public and agencies. 	<p>One-time development of plan, ongoing coordination with other projects and programs</p>
<p>Culvert Program (all highways): Catalogue conditions of all culverts along corridors, identify needed modifications (mostly lengthening to allow for clear-zone improvements), and prioritize/schedule needed improvements.</p>	<p>One-time development of plan, ongoing coordination with other UDOT projects and programs</p>
<p>SR-9 Slow Vehicle Coordination: UDOT to work with school districts, towns, and the Zion Canyon Corridor Committee to identify locations where pull-outs are needed. Develop implementation program for construction.</p>	<p>Ongoing coordination with interested parties, ongoing coordination with other UDOT projects and programs</p>
<p>Springdale Corridor Agreement (SR-9): Develop corridor agreement with Springdale Town. Address UDOT’s access-management standards, develop coordinated planning/design standards, ensure that the city and/or developers pay their fair share for improvements needed as a result of development, address compatibility between UDOT-sponsored roadway improvements and development in town, and address some of the recommendations included in the Zion Canyon Trail Feasibility Study (UDOT, no date).</p>	<p>Within 10 years</p>
<p>Toquerville Corridor Agreement (SR-17): Develop corridor agreement with the City of Toquerville. Address UDOT’s access-management standards, develop coordinated planning/design standards, ensure that the city and/or developers pay their fair share for improvements needed as a result of development, address compatibility between UDOT-sponsored roadway improvements and improvements in town, and identify appropriate traffic-calming measures to reduce speeds and increase safety.</p>	<p>Within 10 years</p>
<p>La Verkin Corridor Agreement (SR-9 and SR-17): Develop corridor agreement with La Verkin City. Address UDOT’s access-management standards, develop coordinated planning/design standards, ensure that the city and/or developers pay their fair share for improvements needed as a result of development, address compatibility between UDOT-sponsored roadway improvements and improvements in town, and identify appropriate traffic-calming measures to reduce speeds and increase safety.</p>	<p>Within 10 years</p>
<p>Virgin Corridor Agreement (SR-9): Develop corridor agreement with Virgin Town. Address UDOT’s access-management standards, develop coordinated planning/design standards, ensure that the city and/or developers pay their fair share for improvements needed as a result of development, address compatibility between UDOT-sponsored roadway improvements and improvements in town, and identify appropriate traffic-calming measures to reduce speeds and increase safety.</p>	<p>Within 10 years</p>

**Table 5-2. EWCTS Recommended Coordination Agreements and Programs**

Agreement/Program	Timeframe
Corridor Maintenance Coordination with Rockville and Springdale (SR-9): Develop a strategy to regularly communicate with Rockville and Springdale regarding maintenance schedules for shoulders, drainage ditches, and culverts.	Ongoing
RPO Coordination (all highways): Develop a strategy to coordinate planned highway improvements with the RPO once it is fully functional and a rural transportation plan for the RPO area is initiated.	Ongoing
BLM Coordination (all highways): Develop a strategy to coordinate highway improvements and construction with BLM in terms of access to BLM-administered land and consistency with BLM land uses. Have regular meetings with BLM to ensure that planning of both agencies is consistent with each agency's overall goals for the corridors.	Ongoing
Zion Park Transportation Coordination (SR-9): Work with the National Park Service to address management of and access to the state highway on either end of Zion National Park. Specific items that need coordination include allowing local residents to pass through the park on SR-9 between I-15 and US-89 without paying a park entrance fee and developing a long-range plan for the Zion National Park shuttle system. Work as part of a team along with the National Park Service, local governments, and private carriers to develop a long-range vision for compatible operation of SR-9 as a state highway as well as an important access to the park.	Initial effort within 5 years, ongoing thereafter
Zion Canyon Corridor Committee Coordination (SR-9): Actively participate in the Zion Canyon Corridor Committee's process to ensure compatibility between UDOT's goals and objectives and the goals and objectives of the committee.	Ongoing until committee concludes its business
Toquerville Bypass Coordination (SR-17): Work with Toquerville to develop an agreement regarding the future of SR-17 and the planned Toquerville Bypass. Focus would be to determine the feasibility of the bypass becoming SR-17, which would require coordination on access management and other UDOT standards.	When needed
SR-17/SR-9 Connector Feasibility Study: Participate in a study along with Toquerville and La Verkin to evaluate the need for and potential routes of a new connector road between SR-17 and SR-9. The new road could be a redesignated SR-17, bypassing the existing SR-17 through La Verkin.	When initiated by local governments
SR-17/I-15 Connector Feasibility Analysis: Participate in study along with local governments to evaluate the need for and potential routes of a new connector road between SR-17 and I-15 south of Leeds.	When initiated by local governments
SR-59/Southern Corridor Connector Feasibility Analysis: Participate in a study along with appropriate agencies (county, BLM, MPO) to evaluate the need for and potential routes of a new connector road between SR-59 and the Southern Corridor.	When initiated by local governments
SR-59/SR-9 Connector Feasibility Analysis: Participate in a study along with appropriate agencies (county, BLM, cities, MPO) to evaluate the need for and potential routes of a new connector road between SR-59 and SR-9. Two potential routes—Smithsonian Butte Byway and Sheep Bridge Road—currently exist as dirt roads.	When initiated by local governments

Each project identified above in Table 5-1, EWCTS Recommended Improvement Projects, is prioritized through a score, or rank. The process by which the scores were developed was both objective and subjective but ultimately represents the priority for needs along the corridor. Funding for the projects listed has not been

identified, nor has the timing and fiscal feasibility of each project or coordination effort been evaluated. The list and prioritization exercise is for planning purposes only and is intended to provide information about the needs of and recommendations for improvements along the study corridors. The implementation of projects and coordination efforts described in this study report will depend on funding, the priority of each project or effort in relation to other needs across the region, and the planning objectives of other agencies and local governments. The following sections explain the process that was used to rank projects.

Criteria

Criteria are the values against which each project was judged. The criteria used to rank the projects reflected UDOT's goals for the corridors. As described in Section 1.3, Vision, Goals, and Objectives, these goals focus on safety, operation and capacity, traffic flow as it relates to land development, and environmental considerations. The specific criteria used are described below.

Safety

- Does the project provide passing lanes?
- Does the project provide or accommodate safe pull-outs?
- Does the project improve an existing intersection that has safety issues?
- Does the project involve improvements that could be incorporated into the existing geometry such as signage, striping, rumble strips, Intelligent Transportation System (ITS) technology (such as the 511 Travel Information program used in parts of Utah), or parking restrictions?
- Does the project bring shoulders up to standard?
- Does the project address existing geometric deficiencies?
- Does the project address bicycle and pedestrian safety needs?

Operation and Capacity

- Does the project address existing or expected congestion related to traffic volume(s)? Does it improve capacity in an area that is currently or expected to be congested?
- Does the project address operational problems at intersections?
- Does the project address sight distance issues?
- Does the project improve existing surfaces and/or structures?
- Does the project improve shoulder and lane width?



Traffic Flow and Land Development

- Does the project include access controls or facilitate partnerships with local developers, ensuring that developers pay their fair share of the needed improvement(s)?
- Does the project propose a corridor agreement with a local government?
- Does the project facilitate land-use planning coordination with local governments?
- Does the project contribute to smooth regional traffic flow?

Environment

- Does the project implement Context-Sensitive Solutions that minimize impacts and enhance the natural and built environments?
- Can the project be constructed such that any impacts to the natural and built environments could be fully mitigated?
- Would construction of the project result in greater protection of adjacent natural and cultural resources?

Ranking Process

The ranking process involved members of the project team. The project team provided the first review and assigned a numeric ranking for each criterion depending on how well each project satisfied the criterion. Reviewers used a scale of 0 to 3, where 0 meant that the criterion was essentially ignored by the project or did not apply, and 3 meant that the project completely satisfied the criterion. Scores for each of the four criteria were then added for each project, by reviewer. An example is provided in Table 5-3.

Table 5-3. Initial Project Ranking Example

Project X	Score
Safety	2
Operation and capacity	3
Traffic flow and land development	1
Environmental	1
Total score	7

Once the team assigned initial “straight” scores by criterion, specific “weights” were applied to each entry. The weights are shown in Table 5-4.

Table 5-4. Weighted Project Ranking Example

Project X	Unweighted Score	Weighted Score
Safety (30%)	2	2.6
Operation and capacity (30%)	3	3.9
Traffic flow and land development (15%)	1	1.15
Environmental (25%)	1	1.25
Total score	7	8.9

The next step was to average the scores. The original and weighted reviewer scores were very similar for most projects, so the team chose not to use a weighted median.

Summary

Table 5-5 and Table 5-6 summarize the improvement project and coordination lists.

Table 5-5. Segment Summary

Highway	Length in Study Area (miles)	Number of Projects	Number of Coordination Agreements or Programs	Number of Projects/Agreements per Segment Mile
SR-9	22	19	13	1.5
SR-17	6	12	9	3.5
SR-59	22	10	6	0.7

Table 5-6. Ranking Summary

Highway	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
SR-9	9-O	9-C	9-D, 9-I ^a	9-P	9-H
SR-17	17-D	17-G	17-J	17-F	17-C
SR-59	59-A	59-F	59-D	59-E	59-C
All (combined)	59-A	59-F	9-O	59-D	9-C, 17-D ^a

See Table 5-1 above, EWCTS Recommended Improvement Projects, for detailed project descriptions.

^a Two projects received the same score and thus are equally ranked.



As shown above in Table 5-5, Segment Summary, SR-9 has the greatest number of projects and agreements, but SR-17 has the greatest number of projects per segment mile because it is so much shorter than SR-9 or SR-59. However, as shown above in Table 5-5 and in Table 5-6, Ranking Summary, all of the corridors have top-ranked projects, with SR-59 having the most number of projects with an overall ranking of fifth or higher. SR-59 has three projects that are ranked fifth and above (ranks 1, 2, and 4) while SR-9 has two (ranks 3 and 5 [tie]) and SR-17 has one (rank 5 [tie]).

As shown above in Table 5-1, EWCTS Recommended Improvement Projects, the top three ranked projects for each corridor stand alone, with the exception of SR-9, where there are two projects that are tied for third ranking. For projects ranked fifth and lower, many projects have the same score. These results indicate that there are some higher-priority projects that should be considered first and that several other projects are also important but are probably not critical and should be considered as funding and opportunity arise.

Section 6.1, Implementation, explains how UDOT might carry out a program of actual project construction based on how the rankings are distributed. Again, this strategy is meant to be used as a guide and is not intended to dictate how and when UDOT constructs projects along the three corridors.

5.3 City Plans

In 2004 and 2005, UDOT worked with the communities of Hurricane, La Verkin, and Springdale to develop community transportation plans. During that planning process, the communities formulated lists of local improvement projects and identified priorities. Because such intensive planning for roads in and near these cities had already been completed at the local level, the study team felt it was important to consider the cities' priorities along the project corridors as it developed the project lists. Table 5-7 below summarizes the projects included in the community plans that occur along the project corridors and how the EWCTS project lists address the community priorities.

Table 5-7. Community Transportation Plan Recommendations

Project in Community Plan	Status
<i>Hurricane (SR-9)</i>	
Priority Project: Realign SR-59 to intersect with SR-9 at 600 North	Issue would be addressed through EWCTS Project 59-A.
Priority Project: Widen SR-9 between 300 West and 600 North	This section of roadway was addressed in a 2005 environmental/concept study (SP-0009[11]10E). Not included on the EWCTS project lists.
Landscape beautification between 6300 West and 900 North	Not included as a stand-alone project in the EWCTS project lists. Improvements in the EWCTS study area could be incorporated into SR-9 improvements evaluated in the 2005 study (SP-0009[11]10E).
<i>La Verkin (SR-9 and SR-17)</i>	
Priority Project: Landscaping/beautification along SR-9 in city limits; add gateway features at city entrances	Could be addressed through corridor agreement with the City, which is included on the EWCTS list of coordination agreements and programs (see Table 5-2 above, EWCTS Recommended Coordination Agreements and Programs).
Priority Project: Sidewalk improvements along SR-9 and SR-17	Some sidewalks have been constructed. Additional sidewalk along state routes could be constructed as part of UDOT road projects (see EWCTS Projects 17-C and 17-F). Not listed as a stand-alone project on the EWCTS lists.
Priority Project: Speed review on SR-9 through La Verkin	Speed studies are initiated by local governments. City responsible for following through with formal request. Not included as a stand-alone project on the EWCTS lists.
Priority Project: La Verkin/Hurricane pedestrian bridge crossing on SR-9	Pedestrian structure constructed on east side. EWCTS Project 9-A addresses pedestrian structure on west side.
Turn lanes at the following locations on SR-9: <ul style="list-style-type: none"> • 100 East (Valley View Drive) • Main Street 	100 East turn lane incorporated into EWCTS Projects 9-C and 9-D. Main Street turn lane not included as a stand-alone EWCTS project.
Signage Projects: <ul style="list-style-type: none"> • Check and place new/additional directional signage at SR-9 and SR-17 intersection • Install advance warning signage at the southbound crossing of Virgin River 	Could be incorporated into the SR-9 and SR-17 sign programs listed in Table 5-2. Sign program expected to include new/additional directional signage for Zion National Park at intersection of SR-9 and SR-17.
Widen SR-9 from Main Street to new Top Side development	EWCTS Project 9-H calls for shoulder widening through part of this area. No new lanes proposed at this time.
Widen shoulders along SR-9 between Virgin River Bridge and SR-17 for parking	Not included as a stand-alone project on the EWCTS lists. Parking issues could be partially addressed through the proposed corridor agreement with La Verkin. Current road width (four lanes) is sufficient to handle 2035 expected traffic volumes through La Verkin at level of service (LOS) D; future widening not a critical traffic need between now and 2035.
Evaluate striping along SR-9 between intersection with SR-17 and the top of the "Twist"	Not included as a stand-alone project on the EWCTS lists. Shoulder, curve, and guardrail issues addressed through EWCTS Projects 9-B, 9-E, 9-F, 9-G, 9-H, and 9-K.
Pull back slopes and install retaining walls along SR-17 between 500 North and 800 North	Issue addressed in EWCTS Project 17-C.

**Table 5-7. Community Transportation Plan Recommendations**

Project in Community Plan	Status
Widen and improve SR-17 from La Verkin to Toquerville	Not included as a stand-alone project on the EWCTS lists. Shoulder widening, rumble strips, and turn lanes between about MP 0.5 and MP 2.5 addressed in EWCTS Projects 17-B, 17-C, 17-D, 17-E, 17-F, 17-G, 17-H, 17-I, and 17-K.
Add new signals at the following locations: <ul style="list-style-type: none"> • Main Street crossing of SR-9 • 480 South crossing of SR-9 (when new school is built) 	Not included as stand-alone projects on the EWCTS project lists. City should formally request signal study for Main Street crossing (August 2008 signal warrant list does not include this intersection). 480 South crossing should be evaluated at the time the new school is constructed/opened.
Add new school crossing at Main Street crossing of SR-9	Not included as a stand-alone project on the EWCTS project lists. Issue could partially be addressed by providing the pedestrian walkway on the west side of Virgin River Bridge (EWCTS Project 9-A).
<i>Springdale (SR-9)</i>	
Priority Project: Improve intersection of SR-9 and Paradise Road	Not included as a stand-alone project on the EWCTS list. Project 9-C includes a two-way left-turn lane that could address intersection problems associated with turn movements.
Priority Project: Sidewalks throughout city	Sidewalk could be constructed as part of local projects or in conjunction with local improvements addressed in the proposed corridor agreement with Springdale (see Table 5-2). Not listed as a stand-alone project on the EWCTS lists.
Priority Project: Shielded lighting throughout city	Appropriate to install as part of local projects. Could be addressed in the proposed corridor agreement with Springdale (see Table 5-2). Not listed as a stand-alone project on the EWCTS lists.
Priority Project: Speed study through city (reduce speed)	Speed studies are initiated by local governments. City responsible for following through with formal request. Not included as a stand-alone project on the EWCTS lists.
Priority Project: Zion Canyon bicycle/pedestrian trail (study and construction)	Not included as a stand-alone project on the EWCTS lists. Trail feasibility study already completed (UDOT, no date). Construction could be part of a cooperative project that includes UDOT making improvements to shoulders west of Springdale (see Project 9-H) that would allow connection to a town-constructed bicycle/pedestrian path.
Culvert maintenance plan review	Culvert program included on the EWCTS list of coordination agreements and programs (see Table 5-2).
Shoulder maintenance plan review	Corridor maintenance coordination with Rockville and Springdale included on the EWCTS list of coordination agreements and programs (see Table 5-2).
Review current passing/no-passing striping between Springdale and La Verkin	Not included as a stand-alone project on the EWCTS lists. Some preliminary evaluation completed as part of the safety study for the EWCTS. Passing needs identified and included as EWCTS Project 9-M.
Identify future passing needs along highway between La Verkin and Rockville	Passing lanes addressed in EWCTS Project 9-M.
Improve (widen) shoulders between Rockville and Springdale	Shoulder widening addressed in EWCTS Project 9-H.
Add signage for Zion National Park parking lots	Could be addressed through SR-9 sign program described on Table 5-2.

Sources: UDOT 2004b, 2005, 2006b

5.4 Access-Management Recommendations

UDOT recognizes that corridor management is a primary policy concern along all three study corridors. Corridor management involves the application of strategies for access management, land-use and subdivision management, right-of-way needs and preservation, operational strategies, intergovernmental coordination, and financing of corridor improvements. The access-management element involves identifying the types, locations, and configurations of permitted access along a corridor to preserve the safety and mobility of major thoroughfares by managing the number of conflict points.

Corridor planning is an appropriate time to start investigating the establishment of detailed agreements between UDOT and the local agencies that are responsible for implementing land use along the study corridors. There is a close relationship between transportation and land uses, because all land use depends to some extent on access to a road to bring people to and from the use. All roads have access points, whether these are individual driveways, local road intersections, or fully controlled interchanges.

Access-management problems arise when the function of a road is out of balance with normal demands. If a highway corridor designed for moving traffic runs through the heart of a community and has many businesses and roads that access the corridor, then through-traffic movements can be negatively affected. However, business owners like to have access to higher-volume roads to bring in more customers, which ensures the businesses' long-term viability. This is especially important on corridors that have heavy tourist and recreation-based traffic and/or that provide important regional connections, such as SR-9, SR-17, and SR-59.

Access points along the road and traffic movement can be in conflict when communities grow without establishing location options for business other than a highway or a main street. If business districts and highways share a route—as SR-9 does through Virgin, Rockville, and Springdale; SR-17 does through Toquerville and La Verkin; and SR-59 does through Hurricane, Apple Valley, and Hildale—then the function of the road for either purpose must be carefully addressed every time there is a proposal for a roadway improvement or new development in the town or city to ensure that the road can meet the critical needs of both access and mobility. The cities must ensure that accesses to locally approved development meet UDOT's access standards. As part of a city's approval process, developers must be willing to pay their fair share of modifications to the state highway system that otherwise would not be required (such as the construction of a new turn lane to serve a new development).



A growing number of transportation agencies are engaging in corridor access management through developing strategies and agreements. Some access issues along the corridors would be addressed by implementing the project recommendations presented in Table 5-1 above, EWCTS Recommended Improvement Projects, and Table 5-2 above, EWCTS Recommended Coordination Agreements and Programs. However, the more-detailed work of establishing access-management agreements, adopting corridor-management policies, following through with land-use coordination, and establishing urban routing will continue in the future.

The corridor planning process can be used to craft local agreements concerning access management along the SR-9, SR-17, and SR-59 corridors. The results of coordination with the public, stakeholders, and local agencies along these corridors suggest that an open, collaborative process favored by all parties will help implement effective agreements and/or policies. By using a consensus-based approach, UDOT and the local agencies will craft agreements that are mutually acceptable and have the support necessary to implement the intent of the agreement.

In general, the project team recommends that UDOT enter into some type of corridor-management agreement with each city or town along each of the corridors. UDOT currently has an agreement with Hurricane along SR-9 from I-15 to the Virgin River Bridge at about MP 11. A copy of this agreement is included in Appendix C, SR-9 Cooperative Corridor Preservation Agreement.

In the absence of formal agreements, the consideration and evaluation of accesses along each corridor should be based on the UDOT Accommodation of Utilities and the Control and Protection of State Highway Rights-of-Way (Utah Administrative Code, Rule R930-6). That rule, which is also discussed in Section 2.2, Roadway Characteristics, outlines recommended access-control policies and procedures for state highways based on the functional classification of the roadway. It provides recommendations for access locations, spacing, and configurations. Each time a new or revised access is proposed, the permitting review and approval process should start with the information in the UDOT right-of-way manual.

The following sections describe the general access conflicts along each of the study corridors.

5.4.1 SR-9

As the only access corridor to Zion National Park, SR-9 will always serve the multiple roles of providing access to local land uses and supporting the tourist and recreational demands of the area. This will require close coordination between each town and UDOT to develop access-management plans and/or agreements that can meet the various needs and demands of the corridor. Each of the communities along the corridor—La Verkin, Virgin, Rockville, and Springdale—has expressed an interest in developing a corridor management agreement with UDOT. These agreements should address items such as:

- Driveway locations
- Intersection locations
- Future traffic signal locations
- Need for acceleration and deceleration lanes
- Need for pull-outs for trailheads, historical markers, scenic view points, etc.
- Opportunities to combine, limit, eliminate, or restrict accesses (right-in-right-out versus full access)
- Speed limits

These agreements will be an important part in ensuring the long-term success of the corridor.



5.4.2 SR-17

SR-17, which serves both as an important regional route between SR-59 and I-15 and as the main local access route through Toquerville and La Verkin, will require special attention to balance the access and mobility needs of the corridor. Along this route, many residences and businesses depend on the corridor to meet access and travel needs. Of special concern on this route are the competing factors of Toquerville's vision to preserve SR-17 as a slower-speed, two-lane road and the regional travel demands that indicate a need for SR-17 to serve as a multiple-lane, higher-speed corridor.

To address this issue, Toquerville has been actively planning a bypass route around the town. Toquerville would like the bypass to serve as SR-17, which would allow the town to maintain the existing route as a local road. If bypass construction is funded, UDOT should work with Toquerville to make sure that the development of the bypass route would meet state design and access standards if the bypass route replaces the existing SR-17 corridor as the main state route through this area.

Whether or not the bypass route is constructed, UDOT should develop a corridor agreement with Toquerville and La Verkin to address access standards and access management along SR-17. An agreement for this highway would likely include the following key components:

- Driveway locations
- Intersection locations
- Future traffic signal locations
- Need for acceleration and deceleration lanes
- Opportunities to combine, limit, eliminate, or restrict accesses (right-in-right-out versus full access)
- Special considerations for heavy truck traffic
- Speed limits

5.4.3 SR-59

SR-59 is a regionally important route that connects northern Arizona to I-15. For this reason, it carries a lot of heavy regional and interstate truck traffic in addition to local, recreational, and tourist traffic. The length of the route (about 22 miles in Utah) indicates that a safe, higher-speed route is desirable to meet the mobility needs of the corridor.

The communities of Hildale, Apple Valley, and Hurricane should develop access-management agreements with UDOT. These agreements should address:

- Driveway locations
- Intersection locations
- Future traffic signal locations
- The need for and location of future grade-separated interchange locations (probably beyond 2035)
- Need for acceleration and deceleration lanes
- Opportunities to combine, limit, eliminate, or restrict accesses (right-in-right-out versus full access)
- Need for pull-outs for trailheads and recreational areas
- Special considerations for heavy truck traffic
- Speed limits

A key element of corridor agreements along SR-59 would be identifying primary access locations and types to accommodate the future planned development in these areas. Land development could push toward multiple access locations along the highway, but the mobility needs of the corridor suggest that fewer accesses would be better. To resolve this issue, the study team suggests that UDOT consider constructing smaller, local grade-separated interchanges similar to the Ledges interchange on SR-18. Small interchanges such as these would provide a higher-volume access in a much safer scenario than traffic signals on the higher-speed corridor. Since much of the adjacent land is not yet developed, the local road system could be planned out in such a way as to route traffic to these interchange locations and eliminate the need for multiple intersections along the corridor. If the interchanges are not needed until after 2035, the consolidation of access points into single at-grade intersections would still provide an access management benefit for UDOT.